

Remarks

Claims 1-7 have been rejected under 35 USC 102(b) as being anticipated by USP 5,854,167.

Claims 1-7 have been rejected under 35 USC 102(e) as being anticipated by USP 5,905,053 or 5,958,824.

It should be noted that claim 3 has previously been cancelled.

Claims 1, 2, and 4-7 have been rejected under 35 USC 103(a) as being unpatentable over USP 5,854,167.

The Examiner is respectfully requested to reconsider these rejections in light of the following discussion.

It has long been known to produce ethylene oxide by molecular oxygen oxidation of ethylene using a supported silver catalyst. Research efforts essentially have been directed to providing so-called promoters which in one way or another enhance the rate, selectivity, etc. of the desired reaction.

In the present situation, a promoter combination is claimed with the supported silver which "consists essentially of (1) an alkali metal component in amount of 1200 to 3000 ppm, based on the weight of the catalyst, and (2) a sulfur component in amount of 40-150% of the equivalent weight necessary to form the alkali metal sulfate."

The Examiner has contended that the claims presently under consideration do not exclude various of the promoters shown in the art, but merely exclude rhenium and transition metals. It is believed that this interpretation should not be sustained.

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Applicant claims a promoter combination "consisting essentially" of the above - designated materials. The phrase "consisting essentially" has consistently been interpreted by the CAFC as a transitional phrase which excludes materials which are not named and which would materially affect the basic and novel characteristics of the claimed composition. See AFG Indus. V. Cardinal IG Co., 239 F.3d 1239, 57 USPQ 2D 1176, for example.

In the instant situation, the prior art promoter combinations require a pnictogen component (USP 5,905,053), a lanthanide component (USP 5,958,844) or a germanium or tin component (USP 5,854,167). Clearly such components are taught as having a material affect on the basic characteristics of the promoter combinations and accordingly are excluded from the compositions set forth in the instant claims through use of the "consisting essentially" phrase.

Applicants have clearly and specifically defined their inventive compositions; these compositions are not shown in the cited art.

The essence of the present invention is in the provision of a catalyst which is both rhenium and transition metal free and which contains a specific promoter combination which consists essentially of the alkali metal component and a sulfur component in designated amounts as well as optionally a fluorine component. The catalyst does not contain other promoters which might provide a significant effect on the catalyst use and performance.

By way of contrast, Rizkalla 5,864,167 requires in the catalyst formulation described therein a germanium or tin component as a critical component of the composition. Quite clearly, compositions which require germanium or tin as an

active and effective promoter component are different and distinct from the catalysts claimed in the instant invention which exclude the presence of such components. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection under 35 USC 102(b) on Rizkalla USP 5,854,167.

Rizkalla USP 5,905,053, requires a component selected from phosphorus, bismuth and antimony as a critical component of the catalyst formulation. As described above, the claims contained herein specifically by their terms exclude catalyst compositions which contain such components as an effective promoter ingredient. Accordingly, it can readily be seen that Rizkalla 5,905,053 fails to provide an anticipation of the instant claimed catalyst composition.

Rizkalla 5,958,824 describes an ethylene oxide catalyst which contains as a critical promoter component a lanthanide material. The claims of the instant case by their terms specifically exclude the presence of an lanthanide component in amount effective to provide a significant promoter effect.

In view of this essential distinction, reconsideration and withdrawal of the rejection of claims as now presented under 35 USC 102(e) on Rizkalla 5,958,824 is respectfully requested.

Claims 1-7 were rejected additionally under 35 USC 103(a) as being unpatentable over Rizkalla et al USP 5,854,167. Reconsideration and withdrawal of this rejection in light of the following discussion is requested.

As pointed out above in connection with the Rizkalla 5,854,167 reference, this reference requires as a promoter component germanium or tin. By way of contrast, the present claimed catalyst by the claimed term excludes the presence

of germanium or tin promoter components in an amount effective to provide a significant catalyst effect.

There has been extensive work by many researchers in the field of ethylene oxide catalysis. There have been an extremely large number of catalyst formulations proposed with sometimes conflicting claims of effectiveness. Against this background of extensive prior work, the present inventor has devised a catalyst which is relatively simple in composition and which is highly effective for the oxidation of ethylene to ethylene oxide. Reduced to its essentials, the catalyst of the present invention comprises a support such as alumina having deposited thereon silver as an essential component together with a promoter combination which consists essentially of the designated amounts of alkali metal together with sulfur and optionally fluorine. By the term "consisting essentially" the compositions claimed herein are limited to the specified components and do not encompass compositions which contain other materials which lend a significant effect to the catalyst performance. The present invention actually comprises the use of amounts of alkali metal such as cesium which are higher than those generally deemed effective in the prior art. The surprising discovery has been made that at such high alkali metal concentrations, which normally would result in a deactivation of the catalyst, the provision of the designated amounts of sulfur results in a catalyst having surprisingly and superior characteristics for the production of ethylene oxide. This is apparent from a consideration of the data contained in the experiments presented in the instant specification.

Accordingly, it is respectfully submitted that the present discovery is indeed surprising when considering the teachings of the prior art and indeed is novel since the specific formulations are not described in the references of record.

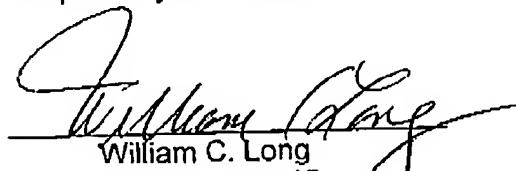
Accordingly, reconsideration and withdrawal of the rejection of the claims on 35 USC 103(a) is respectfully requested.

The Examiner is respectfully requested to reconsider and withdraw the various rejections of the claims presently in the case.

In the event that the claims are not deemed allowable, entry of the remarks contained herein is requested for purposes of appeal.

Since no claims have been added and the fee for a one month extension has been paid, it is believed that no additional fees are owed at this time. Should this be incorrect, kindly charge any fees owed to Deposit Account 12-2138.

Respectfully submitted,

  
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August 22, 2003

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